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Development and validation of uv-vis spectroscopic method of assay of carbamazepine in microparticles (Article) (Open Access)

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Abstract

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Objective: This study aimed to develop a new, rapid, robust, effective, inexpensive, and accurate UV-Vis method for the quantification analysis of carbamazepine (CBZ) in the carbamazepine-loaded microparticles. Methods: CBZ was encapsulated in ethyl cellulose microparticles by a solvent evaporation method using polyvinyl alcohol (PVA) as a stabilizer. Methanol was used to dissolve CBZ followed by dilution with distilled water as diluent. CBZ drug, excipients, and microparticles were subjected to specificity, solution stability, linearity, precision and accuracy to confirm and ensure the validity of this method. Results: The results showed no interference from the excipients in the selected wavelength 286 nm. It was exhibited linearity in the range 2-12 µg/ml with $R^2 = 0.9992$. CBZ solution was stable during 24 h. Accuracy and precision were within the accepted limits (100±2%). All results were in accordance to the ICH-Q2 guideline. Conclusion: As a conclusion, CBZ could be quantified from loaded EC microparticles using UV-Vis spectrophotometer at 286 nm. Therefore, this method can be used for the quantification analysis of CBZ in CBZ-loaded microparticles can be utilized also as an alternative method to calculate CBZ in different dosage forms. © 2019 The Authors.

Author keywords

Carbamazepine | Method validation | Microparticles | Spectrophotometer | UV-Vis

Indexed keywords

EMTREE drug terms: carbamazepine | drug vehicle | ethyl cellulose | polyvinyl alcohol

EMTREE medical terms:

accuracy | Article | binding affinity | drug formulation | drug release | drug solubility | drug specificity | drug stability | flow rate | limit of detection | limit of quantitation | retention time | scanning electron microscopy | ultraviolet visible spectroscopy | validation process

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Chemicals and CAS Registry Numbers:

carbamazepine, 298-46-4, 8047-84-5; ethyl cellulose, 9004-57-3; polyvinyl alcohol, 37380-95-3, 9002-89-5

Device tradename:

UV-1800, Shimadzu, Japan

Manufacturers:

Drug manufacturer:

Merck, Germany;

Anuja Healthcare, India;

Dow, United States

Device manufacturer:

Shimadzu, Japan

Funding details

Funding sponsor	Funding number	Acronym
International Islamic University Malaysia		

Funding text

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